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DA SILVA LIMA ON HEMATOZOA.

[From the French.]

[This memoir originally appeared in the *Gazeta Medica da Bahia* for September, 1877; the French translation, from the Portuguese, being afterwards published in the *Archives de Médecine Navale* for December, 1877. The full title runs:—"New phase of the question relating to the parasitic nature of Chyluria. Discovery of the adult representative of the 'Filaria of Wucherer.' Par le Dr. Da Silva Lima, Médecin de l'Hôpital de la Charité de Bahia."—Eds.]

Those of our readers who have followed the progress of the discussion which has arisen during these last years, as much in our country as elsewhere, on the subject of chylous hæmaturia will, without doubt, learn with great interest a very important fact which has come to us from Australia, and which seems destined to dissolve the problem, so laboriously studied, of the pathology of this disease.

This fact is nothing less than the discovery of the progenitor or parent worm of the microscopic *Filaria* found, for the first time, by Wucherer, at Bahia, in chylurous urine, and since then by divers observers in other tropical regions, not only in the urine, but also in the blood of patients affected with elephantiasis and certain diseases of the skin.

But, before relating this fact, which comes to us accompanied with commentaries and deductions which a discovery of such value demands, we will here take the liberty of recalling the principal phases of the study of chyluria considered as a parasitic affection.

Our distinguished colleague, Doctor Th. Victorino Pereira, in his inaugural thesis, has very judiciously divided the history of hæmato-chyluria into four periods:—1st, Period of the unknown origin; 2nd, Egyptian period; 3rd,

Brazilian period ; 4th, Indian period. It is actually necessary to add (5th) the Australian period.*

In the first, as says our colleague, the hæmaturia was considered as an eliminatory flow of the fat that was not burnt in consequence of a vice of the hæmotosis; in the second, as due to the parasite of Bilharz; in the third, as re-asserting itself in consequence of the presenee of the filaria of Wucherer; in the fourth, as a symptom of the infection of the blood by a new hematozoon, this same Filaria of Wucherer; in the fifth, we ought to add, it will be regarded as one of the symptoms of the helminthiasis occasioned by the adult representative of these microscopic embryos.

Leaving aside the first epoch of investigation of the hæmato-chyluria (an epoch of hesitation, of conjectures and of theories more or less ingenious, that subsequent facts began to shake and which recent discoveries have deprived of all the interest and all the importance in which they rejoiced), we shall occupy ourselves with those epochs during which this affection began to be considered under an altogether different aspect—thanks to clinical observation and to the revelations of the microscope, which came to replace purely speculative controversies.

In 1851 Bilharz discovered the parasite which now bears his name (*Bilharzia hamatobia*, Cobbold), and the association of its presence with the hæmato-chyluria of Egypt; a fact confirmed by other observers in this same African region, and later by Dr. G. Harley in the urine of a patient who contracted the disease at the Cape of Good Hope.

In August, 1866, our regretted collaborator and friend, Dr. Wucherer, occupying himself, at the invitation of the learned Griesinger, to verify here the preceding discovery, as well of this nematode† as of its eggs, found in the chylous urine of one of our patients an embryonic nematoid altogether unknown. A few years after, this important fact was also confirmed in the United States by Salisbury, in the Antilles by Crevaux, and in India by Lewis.

Here and in these regions the constant presence of this worm in the milky urine became notorious.

It seems proper to recall a circumstance very remarkable

* To this must also be added a 6th or Chinese period—relating to the discovery of the larvæ and their metamorphoses within the stomach of the mosquito (*Culex mosquito*). This has been communicated to Dr. Cobbold by Dr. Patrick Manson, who is stationed at Amoy, China. See a letter in *The Lancet* for January 12th, 1878 (p. 69).—Eds.

† In the French Dr. Lima is made to say “Ce nématode,” but clearly the words ought to be “ce trématode,” as the author refers to *Bilharzia*.—Eds.

by its singularity, which, at a given moment, if this fact remains unique till now, has had a considerable influence on the pathological explanation of the hæmato-chylous urine. At the moment when Wucherer was seeking for the *Bilharzia hæmatobia* he found instead of it an unknown worm.* Later on, Dr. Cobbold, studying the embryology of this fluke-parasite in the urine of a patient who had resided in Africa, discovered the eggs of a nematoid which contained embryos perfectly resembling those of Wucherer.

In 1872 Dr. Lewis not only verified at Calcutta the presence of these nematoids in the embryonal state in the chylous urine, but, what is more extraordinary, he discovered them equally in the blood of the patients affected with chyluria, diarrhœa, elephantiasis, and even in persons appearing to be in good health.

He proposed for the designation of this new species of non-adult helminth the provisional denomination of *Filaria sanguinis hominis*. Some time after, P. Sonsino also discovered the same animalcules in the blood of the hæmaturics of Egypt.

In 1875 Dr. O'Neill on the West Coast of Africa, and our studious colleague, Dr. Araujo at Bahia, encountered, almost at the same time, the same microscopic *Filaria*, proceeding from the skin affected with a disease peculiar to negroes, which they called "craw-craw," and to which *Filaria* our compatriot gives the name of *Filariose dermatemica*.† Recently a distinguished medical man, Dr. Felício dos Santos, encountered the same embryonal nematoid in the blood of an individual affected with elephantiasis—a unique fact up to the present time in relation to patients of this kind, and which since has never been verified at Bahia in spite of all tentative efforts made to do so.

Such are, in short, the facts relative to the coexistence of animalcules with hæmato-chyluria, and with other affections which do not appear to possess in common the least pathological analogy. The *Bilharzia* associated with hæmaturia and dysentery in Egypt; the *Filaria* of Wucherer associated with the same affection in Egypt, Brazil, the Antilles, the United States, and India, and, moreover, in this last-named region and in China associated with the elephantiasis of the scrotum and with diarrhœa, and with "craw-craw" on the West Coast of Africa.

Let us now see the interpretation of these facts.

* A similar observation has been made by Dr. Sonsino, and commented on by Sir Joseph Fyler in 'The Lancet' for August, 1876 (p. 281).

† See 'Arch. de Med. Nav.' tom. xxiv, p. 229

The presence of the *Bilharzia* is considered as a cause of hæmaturia and of one form of dysentery in Egypt.

The eggs of this parasite have never, up to the present time, been found in the urine of the hæmaturics of Brazil; no adult animal has ever been discovered in its seat of predilection. As much in consequence of the rarity amongst us of cases of death by chylous hæmaturia as by the difficulty of obtaining the means of making autopsies, Wucherer made for a long time vain efforts to discover some eggs. This allows us to presume that this parasite is very rare or that it is not to be found in our climate. But its coexistence with our *Filaria* in Africa in the same individual cannot be held in doubt, according to the observations of Cobbold and Sonsino. Up till now it has not been established in India that the *Bilharzia* has been found there.

What rôle do these parasites or their larvæ play in the pathogeny of the hæmato-chyluria and dysentery in Egypt and at the Cape? This still remains to be determined.

Concerning the *Filaria* of Wucherer, which interests us more particularly, let us see what have been the principal opinions put forth up to the present time on its presence in the chylous urine, the blood, the lymph, &c.

Our illustrious collaborator has made known in the *Gaz. Méd. de Bahia* his important discovery under the modest title of "Preliminary Notice on a species of Worm at present not described;" still more modestly he formulated in the following manner his judicious and prudent conclusions:—"It would be rash on my part to put forth a conjecture on the coexistence of these worms of the hæmato-chyluria, and on the etiological signification which they might have? I shall therefore abstain until I have been able to make more ample investigations, and until I have been permitted to examine the corpse of a hæmaturic, which has not yet been possible." (*Gazette Médicale de Bahia*, Dec., 1868, p. 99.)

In the four articles that the learned observer published the following year we do not find a word on the etiological signification of these helminths; he hardly mentions them; he admits that he is ignorant of what manner and in what state of evolution the progenitors of these animæules penetrate into the human body, how they arrive in the kidneys, what is the destiny of these embryos once that they have been expelled with the urine, &c.

Since Wucherer, although many works have been published either in the form of articles in the journals or in the form of theses, no important fact has been produced, nor has

opened to the scientific world any vast field of conjectures or of theories. Some have wished to see in the presence of the worm in the embryonal state in the chylous urine only a mere coincidence; others have considered it as the principal, if not the unique, cause of the disease. Among these last some supposed that the embryos were really the cause, others thought that it was only the adult animal which played this rôle; they presumed that it existed in some hidden part of the organization, such as the blood-vessels, the lymphatics, the kidneys, the bladder, &c.

The discovery of Lewis and the later facts established by Manson and by other observers who encountered the *Filaria* of Wucherer in the blood and in the lymph of patients affected with elephantiasis of scrotum and with chyluria, as well as the coexistence of these diseases, not only in the same countries, but also in the same individual, led to the conclusion that their parasitical etiology was in common. There was thus equally established a connexion between these two diseases and a peculiar eruption in the vesicules of which O'Neill, in Africa, and Dr. Silva Arango, at Bahia, found the same helminths in patients who were not affected with chyluria.

Thus, with the presence of the *Filaria* of Wucherer in the economy would correspond three distinct pathological forms, and further, they are determined by the seat of this animalcule or of its parents. The symptoms are, in certain cases, chyluria; in others, elephantiasis, lymphatic varix, *craw-craw*, &c.

With regard to this subject opinions vary very much; some deny, others hold in doubt, as not being proved, the verminous nature of chyluria; there have been found, notwithstanding, vigorous defenders of the theory of helminths. Among these defenders we shall cite in the first place our distinguished colleague Dr. Almeida Conto, who has sustained this opinion in his thesis concours, and particularly in a remarkable article published in the *Medical Gazette of Bahia* (January and February, 1877).

Such is the state of the question as regards chyluria observed at Brazil and in other intertropical countries. As to the relation which exists between this disease and elephantiasis, which for many years have frequently been seen to coincide in the same individual at Rio de Janeiro, we have not observed it here. As to that which concerns the *Filaria* of Wucherer, so often encountered in the blood of chylurics and of individuals affected with elephantiasis in India and in China, it has been proved only twice at Brazil; the first,

in the blood of the papules of a cutaneous eruption; and the second, in that of a subject affected with elephantiasis.

It is under these circumstances that the fact that we are about to relate has come to our knowledge. If it be confirmed, it promises peremptorily to decide the question in favour of those who hold the parasitic etiology of chyluria.

It is Dr. Cobbold, the eminent English helminthologist, who has first announced, in *The Lancet* (No. of 14th of last July), the discovery of the adult *Filaria*, of which the embryos have so much preoccupied, during these last years, the observing medical men of the intertropical countries.

He says that the brilliant discoveries of Lewis, continued in Egypt by Sansino, and by Weleh and others in England, have been verified by the observations of Dr. Bancroft in Australia. He has found in the sexually mature state the form at least of one of the species of microscopic hematozoa.

Already, Dr. Cobbold had found, in 1876, in some blood sent from Australia, in capillary tubes, from a hæmaturic, a nematoid egg. This fact almost certified the existence, in the human body, of an adult worm. Dr. Roberts, of Manchester, who had sent these tubes to Dr. Cobbold, had already verified, in the blood that they contained, a microscopic hematozoön, discovered in Australia by Bancroft. This doctor (Bancroft), at the instigation of Dr. Cobbold, actively continued his investigations; they resulted in the communication of the following new facts, addressed to Dr. Cobbold, and dated from Brisbane, Queensland, April 20th, 1877.

“I have with great ardour followed up the research for the parent parasite, and I am happy to tell you that I have found five specimens of worm, which I hope to send to you as soon as I shall have a safe opportunity. I reckon about twenty cases of this parasitic disease, which, I believe, explain the chyluria, a certain form of hæmaturia, a form of spontaneous lymphatic abscess, a particular soft varix of the groin, a hydrocele containing a fibrinous liquid, another with a chylous appearance, also some forms of varicocele and orchitis. All this I have verified.

“In the colony there are found no cases of elephantiasis of the legs or of the scrotum; but, by the description of these affections in the memoir on the diseases of the skin, and of other diseases of India by Fox, Farquhar, and Carter, and by Dr. Roberts’s article on these last named in a book on the affections of the urinary passages, I think that the parasitic nature of these diseases will be established.

"The worm is, more or less, of the thickness of a hair, and from three to four inches in length.

"The Filariae described by Carter came forth in prodigious numbers by openings placed towards the centre of the body.

"My first specimen was found, Dec. 21st, 1876, in a lymphatic abscess of the arm. It was dead. I obtained four other living individuals from a hydrocele of the spermatic cord; they found themselves stopped at the orifice of a special trochar that I employ for puncture. I preserved them alive during one day; I had much trouble to separate them from each other. When the worm was plunged in pure water it stretched itself and then remained perfectly still. In this state it was readily extracted from hydroceles, with a great trochar, from the patients known to be attacked with Filaria.

"I will soon send you more details about my cases and the worms."

"Such is," says Dr. Cobbold, in finishing his article, "the report rendered of these discoveries that Dr Bancroft gives us, and according to the brief description which he traces of the parasite I propose to give to this adult nematoid the name of *Filaria Bancrofti*."

He adds that he shares the opinion of the Drs. Bancroft, Lewis, Sonsino, Payrer, and others, who think that a considerable group of morbid states, of which the manner of origin is yet very obscure, proceeds from the injurious influence of the microscopic Filariae.

The discovery of Dr. Bancroft has an incontestable importance, whether one arrives or not at being able to demonstrate with certainty that the nematoid, of which the author of the preceding article has given a name so advantageously known in the scientific world, is the progenitor of all the microscopic Filariae found concurrently with the symptoms of chyluria and of other enumerated morbid states. These animals in the embryonic state have not, in truth, a very great resemblance to each other, according to the descriptions given by the observers of divers countries; nevertheless we expect with confidence the demonstration of their perfect specific identity, and particularly of their common and legitimate affiliation with the adult worm which has just been discovered in Australia.

The more extended and minute works which the Drs. Cobbold and Bancroft promise us will, perhaps, disperse in great part, if not totally, the doubts which still exist in the minds of some medical men as to the veritable origin and

the nature of the hæmato-chyluria, and of the affections which offer, as a common bond with them, the presenee of the same helminth in the urine, the lymph, and the blood.

Appendix.—By MONS. A. LE ROY DE MÉRICOURT, Médecin en Chef de la Marine et des Colonies ; Officier de la Légion d'Honneur.

Our excellent confrère and friend, Dr. Silva Lima, devotes the close of his article to an expression of the regret that he feels at the oblivion in which the learned English helminthologist has left the venerated name of Dr. Wucherer, when he (Dr. Cobbold) quotes in his memoir the indefatigable observer whose labours have contributed to the elucidation of this question. The name of Wucherer deserves, however, to figure in the first rank in the chronological order of investigators. Dr. Cobbold had already previously associated with this subject the names of Leuckart, Vix, Bastian, Heller Lewis, and Salisbury (*Med. Record*, No. 1, p. 6). This neglect, certainly involuntary, on the part of the English helminthologist (in the article in *The Lancet* of last July 14th) is repaired in a new article from the same *savant*, on the *Filaria Bancrofti*, inserted in the same periodical, No. 3, of Oct. 6th, 1877. Doctor Da Silva Lima will have welcomed, with a lively satisfaction, this new and legitimate homage paid to the memory of Wucherer. Here, moreover, is the substance of Dr. Cobbold's last article, which will complete the communication of our distinguished contemporary of Bahia.

Last 28th August, Dr. Cobbold received from Dr. Bancroft three tubes containing some adult female *Filarie*, preserved in glycerine, and a fourth containing some embryos and the eggs. The microscopical examination allows the following characters to be given to this species:—*Filaria Bancrofti* (Cobbold), body capillary, smooth, of a uniform volume. The head furnished with a simply circular mouth, denuded of papillæ; neck straight, about a third of the thickness of the body. Tail of the female simple, suddenly narrowing. The reproductive orifice is situated very near the head, the anus close to the extremity of the tail. Length of the female three and a half inches; thickness, $\frac{1}{10}$ of an inch. Embryos from $\frac{1}{200}$ " to $\frac{1}{125}$ " in length; eggs, $\frac{1}{1000}$ " by $\frac{1}{1500}$ ".

The female worm only has been found.*

In giving the name of Dr. Bancroft to this sexually

* By a slip of the pen this passage stands "Le mâle du ver seul a été trouvé." It should have been "La femelle," &c.—EDS.

mature worm Dr. Cobbold wished to recall at once the origin and the date of the discovery (Brisbane, Dec. 21st, 1876). This appellation ought in no wise to diminish the merit of Lewis, who first gave to the immature worm the name of *Filaria sanguinis hominis*. Drs. Salisbury and Cobbold had previously found the embryos still enclosed in the chorion, which should be the young of the *Filaria Bancrofti*; but it was reserved to Lewis to discover the hæmatozoal character of the young of this worm and to find them in the blood. If the relation of origin established by Dr. Cobbold between the embryo and the *Filaria Bancrofti* should come to be verified, it would be absurd to call the adult worm *Trichina cystica*; however, Salisbury has given this name to the parasite found in the urine. In conclusion, the adult *Filaria sanguinis hominis* (Lewis) and the *Filaria Bancrofti* (Cobbold) are evidently no other than the same species under two denominations. Cobbold goes farther, he expresses the opinion that all the different larval forms separately described by Salisbury, Lewis, Sonsino, Wucherer, Crevaux and Corre, Da Silva Lima, Bancroft and himself, must be referred to one and the same species. If the denomination given by Lewis is adopted to designate the adult worm in preference to that of *Filaria Bancrofti*, Cobbold does not make any objection.

A. LE ROY DE MÉRICOURT.

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